Use of real-time analytics in
Population Health

A SCALABLE HEALTH WHITE PAPER

CONTENTS

EXECUTIVE SUMMARY

Population Health Management (PHM) considers many determinants of health including access to medical care, social and physical environments, genetics, and individual behavior to predict future population healthcare needs. PHM considers various types of data to guide healthcare programs and to estimate their value. Unfortunately, this information is vast and unstructured and thus cannot be used effectively in its raw form. For example, CPOEs and other data from clinical decision support systems result in more and more data being generated by the healthcare industry daily. The data ranges from doctors' prescription scans, medical imaging, insurance, and machine and sensor feeds to social media (Twitter feeds, Facebook posts, and other social media platforms) and web updates. This data provides information about the entire population's health and health trends. To gain meaningful insights that can assist PHM, this disparate data needs to be transformed into strategic business intelligence.

Data scientists are developing increasingly sophisticated analytical tools that generate actionable insights. In healthcare, these applications uncover patterns and associations within available data, creating models and forecasts that can save lives, improve care, and lower costs. This potential can be harnessed to meet real-time needs. By integrating disparate data through data modeling, forecasting, real-time analytics, and specialized software, a robust analytics platform can deliver user-friendly, real-time information directly to providers.

Real-time analytics has the potential to provide a level of detail and precision for a population or a segment helping track the relationship between care events, health considerations, and the outcomes amongst the segment. Models prepared by real-time healthcare analytics enable healthcare decision-makers to develop treatment protocols with a continuous 'engage & improve' cycle between care providers and care program owners for better outcomes.

This white paper discusses the effectiveness of the adoption and use of real-time analytics in population health and how it is now a strategic imperative.

INTRODUCTION

In general, the purpose of real-time analytics tools and software is to model and connect the available data in a structured manner and transform the entire information into actionable insights for the healthcare provider.

Every day, there is more and more data being generated by the healthcare industry. Including CPOEs and data from clinical decision support systems. Every point of inquiry to every point of entry, driven mainly by regulatory compliances, has resulted in the exponential growth of unstructured data.
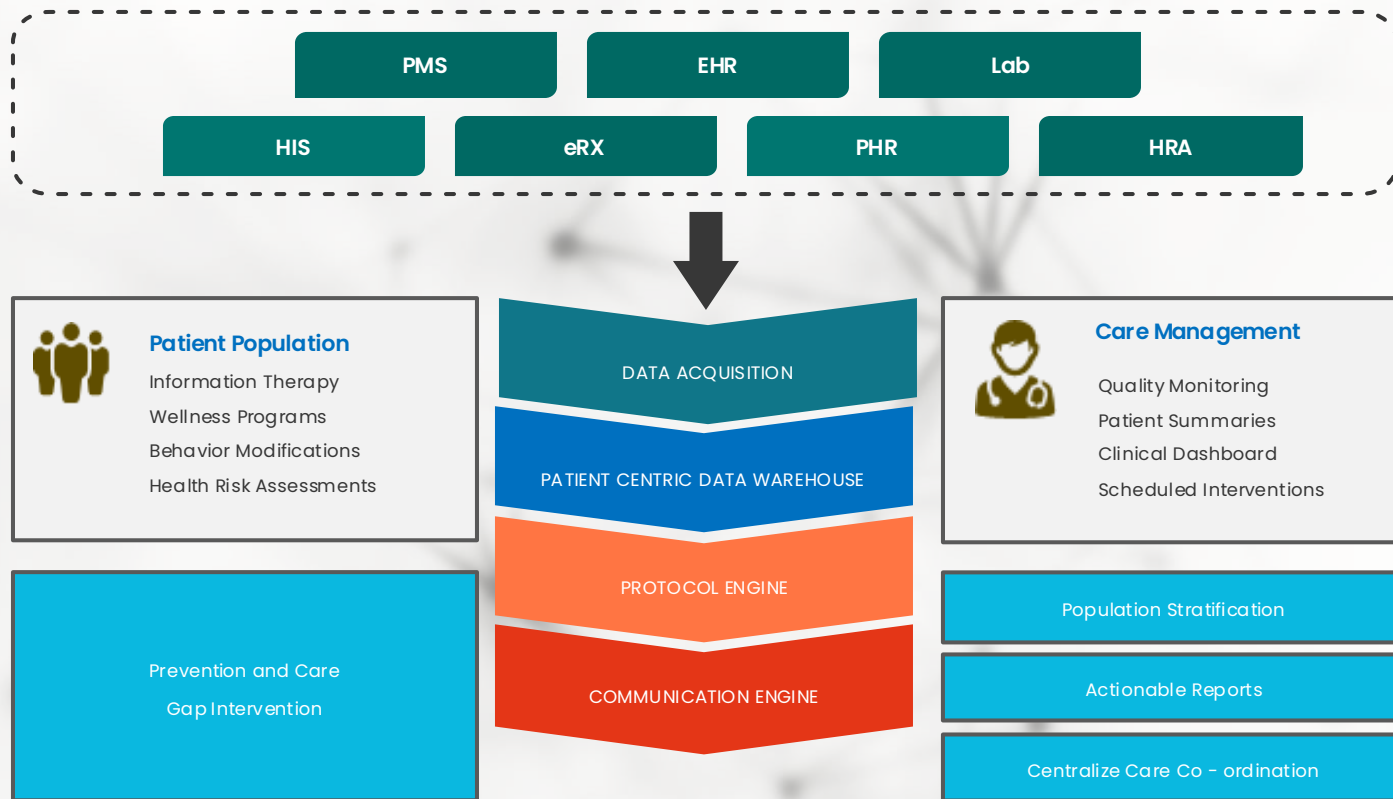
Along with the growth of structured and unstructured data, the outcomes from data analysis such as statistics, machine learning, data mining, and predictive analytics continue to grow as well. The ultimate objective is to transform data into beneficial outputs for better predictability, decision-making, and planning for better population health.

Population-level health insights derived from this data are

invaluable for Population Health Management (PHM), a growing

focus in healthcare. Beyond simply reacting to illness, providers seek data to proactively identify and address undetected or untreated conditions before they become symptomatic. Data analytics enables preventative care by helping providers pinpoint at-risk population segments for specific conditions.

For Population Health Management (PHM), analyzing large amounts of population health data yields valuable insights. Healthcare intelligence tools, including modeling, forecasting, and dashboards, support PHM by providing this crucial information. These tools and insights empower providers to make better decisions by increasing operational efficiency and improving predictive accuracy.

Diseases and their associated data are both growing exponentially. Hence, healthcare providers and decision-makers must adopt tools, infrastructures, and techniques for better leveraging real-time analytics or risk losing competitive positioning to more innovative providers.

PMS	EHR	Lab
HIS	eRX	PHR	HRA

Patient Population

Information Therapy
Wellness Programs
Behavior Modifications
Health Risk Assessments

Prevention and Care
Gap Intervention

DATA ACQUISITION

PATIENT CENTRIC DATA WAREHOUSE

PROTOCOL ENGINE

COMMUNICATION ENGINE

Care Management

Quality Monitoring
Patient Summaries
Clinical Dashboard
Scheduled Interventions

Population Stratification

Actionable Reports

Centralize Care Co - ordination

CHALLENGES FACED WITH POPULATION HEALTH AND HEALTHCARE DATA

With digital advances, the stakes have become increasingly high for healthcare providers and decision-makers to predict the onset of diseases for earlier intervention resulting in better patient healthcare at lower costs.

PHM has been identified as the most critical element in developing better and evolved sustainable healthcare models. While healthcare organizations strive to adopt best practices and technology solutions, they must first address the challenges to PHM.

Challenges to Population Healthcare Management

• Identifying and segmenting the population based on high-risk and other factors.

• Creating, implementing, and monitoring preventative care plans and practices.

• Communicating with individuals and broader communities.

• Categorizing and structuring of healthcare data.

Electronic Health Record (EHR) systems alone cannot provide the level of PHM that providers need to achieve better outcomes and reduced costs. The healthcare industry has rightly focused on the deployment and optimization of EHRs but to realize any significant benefits, these IT innovations are just a start.

While Electronic Health Records (EHRs) store vital patient data, most organizations lack the data analysis capabilities needed for risk categorization and actionable insights. The sheer volume of healthcare data requires specialized solutions: some for storage, some for structuring, and others for both structuring and generating innovative, actionable results.

There is also a further challenge to PHM, very few health organizations have an appetite for IT investments related to Population Healthcare Management. Many providers have tightened IT budgets previously allotted to regulatory compliance and investments in healthcare technology. Hence, resource allocation has a higher priority than innovation.

While many Population Health Management (PHM) leaders embrace technology, they haven't fully grasped the potential of real-time analytics for population health. This is because organizations often mistakenly believe that simple digitizing data is sufficient. Effective care management requires diverse methods, technologies, and approaches. The true value of healthcare data is only unlocked through efficient leveraging and management.

The population might accept the idea of consumption, transfer, and analysis of data quickly to enhance customer care in general. However, when it comes to healthcare - trusting an automated output is a huge concern. Despite the very surety that real-time healthcare analytics offers, healthcare dictated by a machine is threatening to the average patient.

EVOLVING THE HEALTHSCAPE – REAL-TIME ANALYTICS AND POPULATION HEALTH

When it comes to giving and ensuring quality healthcare to a large, categorized, or varied population, it takes both clinical and operational expertise to work in collaboration.

Imagine a newly diagnosed diabetic patient. Upon diagnosis, the physician updates the EHR automatically enrolling the patient in a diabetes management program. The patient receives program information, including daily activities like weighing themselves at home. Significant changes in the patient's data trigger updates to the physician. While such real-time feedback and proactive care exist, they are likely limited to pilot programs or specific patient groups.

Real-time analytics are key to revolutionizing healthcare. Accurate, real-time population segmentation (high-risk, early symptoms, chronic conditions) requires both clinical and claims data. Comprehensive, accurate data mapping is crucial due to complex patient needs and care access. Beyond efficient data capture, leveraging EMRs is essential for feedback that improves clinical and operational performance.

Traditional business intelligence (BI) offers periodic, retrospective, and often more quantitative than actionable reports. Real-time analytics, conversely, provides a continuous flow of current data and rich, high-quality information. Intelligent algorithms track data patterns, enabling automated actions based on historical models, real-time context, and business needs.

This delivers the necessary data at the point of need, facilitating real-time human inquiry within the user interface.
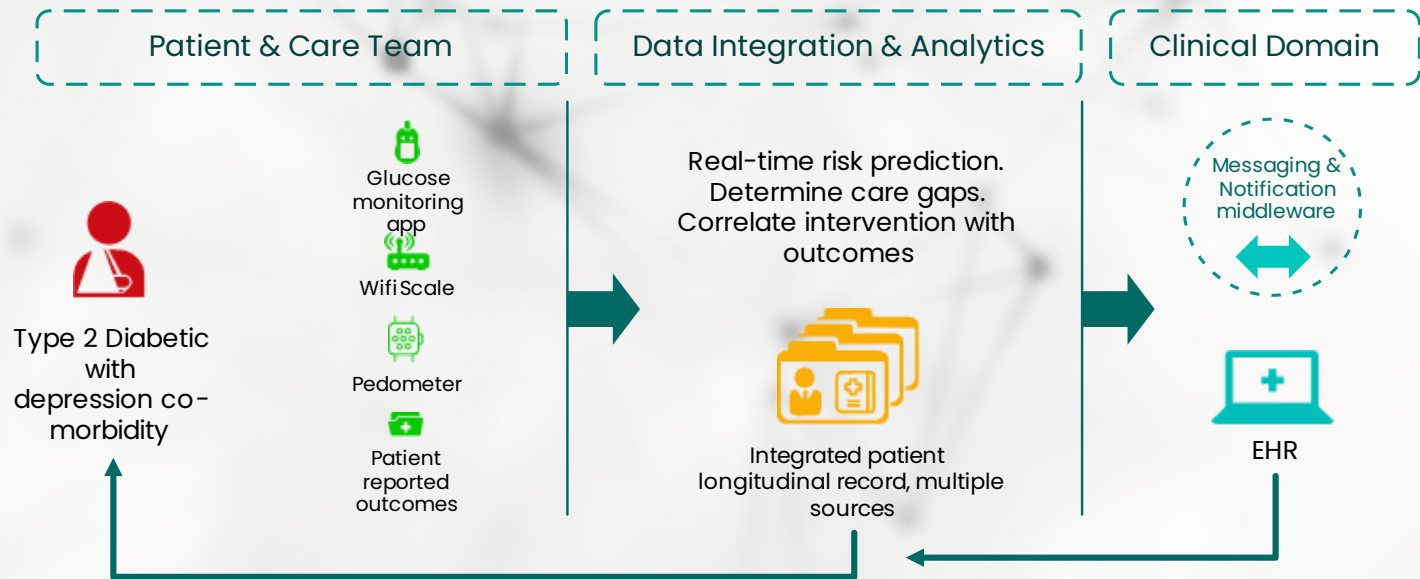
Clinicians input monitoring criteria, and the system provides real-time information. The software tracks all patient events (admissions, discharge, checkups, labs) feeding data to analytic algorithms that populate real-time risk modeling dashboards. These dashboards display patient-specific or population-wide data (e.g., hemoglobin, blood pressure, diabetes risk, heart disease).

The healthcare decision-makers and providers use this information, models, and predictions to monitor populations, assess care formats and processes, alter care methods, and plan for better care delivery.

Real-time data from healthcare apps helps monitor at-risk type 2 diabetes patients. Given the higher prevalence of depression in these patients and the negative impact of untreated depression on self-care and glycemic control, data analytics can integrate these insights to mitigate broader population health issues related to this comorbidity.

Changes in patient data relative to glucose levels and other health considerations, such as fluctuations in weight or activity levels, are conveyed in real-time to healthcare providers. Armed with these data points, practitioners can begin early intervention for both diabetes and depression.

Patient & Care Team

Type 2 Diabetic with depression co-morbidity

Glucose monitoring app

Wifi Scale

Pedometer

Patient reported outcomes

Data Integration & Analytics

Real-time risk prediction. Determine care gaps. Correlate intervention with outcomes

Integrated patient longitudinal record, multiple sources

Clinical Domain

Messaging & Notification middleware

EHR

REALIZING THE POWER OF REAL-TIME ANALYTICS IN POPULATION HEALTH – BENEFITS

By accepting digitization and combining it with healthcare protocols, providers are realizing the benefits that real-time analytics can provide from single-physician offices to multi-provider groups to large hospital networks to even governmental agencies.

MODERN HEALTHCARE TECHNOLOGY BENEFITS Reduction of Costs: There is an increasing concern as to how hospitals and care providers are losing money resulting from the failure to use available clinical data. A real-time analytics tool can:

- Help identify highly profitable and less useful services.

- Understand expensive treatments and their providers and how to mitigate expenses.

- Develop an efficient claims process that helps cut costs while improving operational efficiency.

- Curb a trend from reactive, last-minute high-level investments in cures to a proactive preventative approach.

Enhancing Patient Outcomes – The possibility of readmitted patients or patients undergoing the same treatment without experiencing its benefits is a challenge that needs to be addressed. A real-time analytics tool can:

- Understand and enable key performance indicators to detect risks and analyze trends.

- Use patient data from various sources and provide tangible predictions and suggestions for better care outcomes.

- Translate clinical data and other related data into useful information displayed on user-friendly dashboards.

- Help fine-tune treatments while reducing lengthy hospital stays and readmissions.

Enabling tracking of performance over time – determining whether a certain course of treatment is working or a prevention campaign is on the right path. This information is very important. A real-time analytics tools enable:
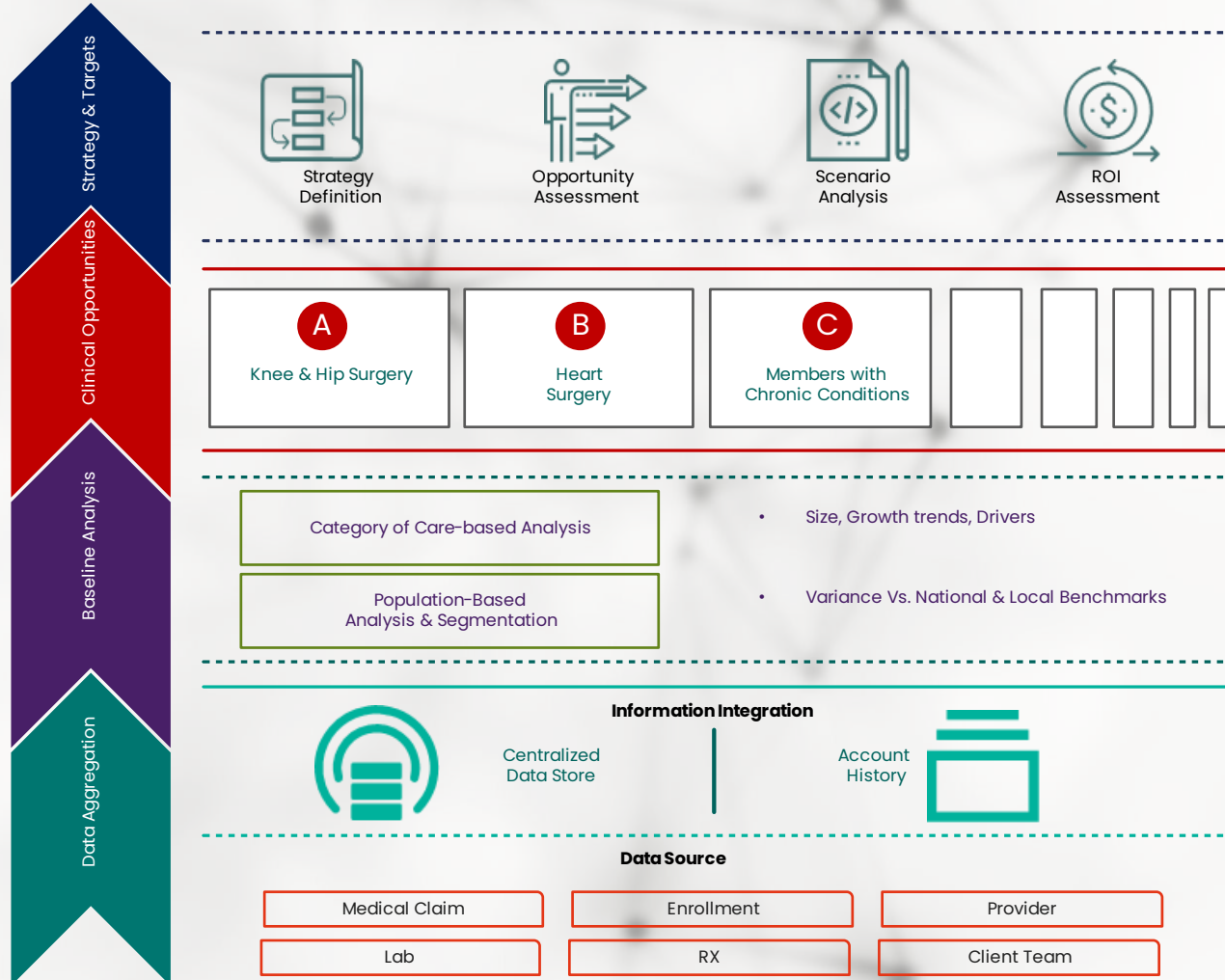
- Improved reporting and patient-centric care coordination.

- Ensures providers have complete patient information in real time.

- Offers improved tracking of the performance of newly enabled care methods or population treatment acceptance trends alongside their outcomes.

Helping critical decisions – Understanding whether an investment in new healthcare technology is required, whether a new insurance plan will work, or whether a certain new health campaign awareness is necessary. These are critical decisions. A real-time analytics tool helps:

- Model data to assist care providers in making better decisions related to investments in new healthcare technology.

- Predict certain cancers or other manageable diseases allowing insurance companies to come up with proactive plans to reduce progression in at-risk populations.

- Create awareness campaigns to identify various high-budgeted costs. Having real-time information that enables the provider to campaign for better health practices.

Real-time analytics tools and software develop data models that enable decision-makers to design and prepare evidence-based solutions that lead to continuous improvement and the management of population health in the long run.

STRATEGY & TARGETS

Strategy & Targets

Clinical Opportunities

Baseline Analysis

Data Aggregation

Strategy Definition

Opportunity Assessment

Scenario Analysis

ROI Assessment

A	**B**	**C**
Knee & Hip Surgery	Heart Surgery	Members with Chronic Conditions

Category of Care-based Analysis

Population-Based Analysis & Segmentation

- Size, Growth trends, Drivers

- Variance Vs. National & Local Benchmarks

Information Integration

Centralized Data Store

Account History

Data Source

Medical Claim	Enrollment	Provider
Lab	RX	Client Team

CONCLUSION

The pilot projects using real-time analytics for better healthcare delivery are showing promising results. It is no longer sufficient to just store aggregated data when organizations have the tools to mine actionable insights from high-value data resources. Healthcare providers and organizations are adopting intelligent systems and predictable tools that can be leveraged to outline high-risk population sets and proactively intervene. Data analytic tools assist healthcare providers in identifying and preparing for emerging healthcare trends. Insightful data creates opportunities for continuous improvement and networks that enhance population health management by focusing on patient state-of-health (SOH) stratification, chronic disease management, incentive management, and point-of-care management.

About Scalable Health

Scalable Health is healthcare division of Scalable Systems focused on providing innovative products and solutions in healthcare and life sciences market.

www.scalablehealth.com

About Scalable Systems

Scalable Systems is a Data, Analytics & Digital Transformation Company focused on vertical specific innovative solutions. By providing next generation technology solutions and services, we help organizations to identify risks & opportunities, achieve sales and operational excellence to gain an innovative edge.

www.scalable_systems.com

Scalable Health

Email: info@scalablehealth.com
Web: www.scalablehealth.com